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HANDBOOK

FOR

40-PR. RIFLED B.L. GUNS (SIDE CLOSING),

ON

6-FT. PARAPET CARRIAGE. (LAND SERVICE.)



By Authority.

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MEMO.

This handbook is corrected up to 1st February, 1885.

40-pr. R.B.L. Gun (Side Closing).

DESCRIPTION OF GUN AND SIGHTS.

(§ 4410, *List of Changes.*)

DESCRIPTION.

Length	{ total (nominal)*..	..	10 feet 1 inch.
	{ barrel, total ..	..	8 feet 10.375 inches.
	{ powder chamber..	..	13.5 inches.
	{ shot chamber ..	..	7 inches.
Preponderance	..	..	4 cwt. 3 qrs. 24 lbs.
Calibre (<i>i.e.</i> , diameter of grip)	..	..	4.75 inches.
Nominal weight	..	..	35 cwt.
Grooves	..	..	56.
Twist of rifling, uniform	..	..	1 turn in 36.5 calibres.
Vent..	..	..	Copper, radial, 6.51 inches from end of bore, in- clined at angle of 45° to vertical plane of axis of gun, on right side.

The gun consists of the barrel (or A tube), the breech piece and B tube, the trunnion ring, and three coils.

The *slot* is on the right of the breech piece for the introduction and removal of the breech block; it is continued through the side of the breech in the form of a circular hole.

The *breech block*, converted from the original vent piece by plugging up the vent, is of wrought iron or steel, and closes the end of the breech before firing. It is supported by an upper and a lower bracket, between which it slides into its position, and is then tightened up by means of the breech screw, its movements in and out of the gun being limited by a spring stop worked by a small lever.

The *breech screw* fits the thread cut in the breech piece, its use is for sending home and retaining the breech block in its proper position.

The *tappet ring* is fitted on the octagonal parts of the breech screw, on which it acts as a wrench, the power being communicated through its projections from the tappets of the lever.

The *lever* fits on the breech screw behind the tappet ring; it is free to revolve round the breech screw, but is prevented from falling off by two keep pins working in grooves. The object of the lever and tappet arrangement is to gain a powerful momentum in tightening up and relaxing the breech block from its seat in the gun.

The *indicator ring* is a thin narrow ring of wrought iron fitted on the breech screw in front of the tappet ring; it is so adjusted on the screw that when the breech block is home the raised line of brass, or arrow, on the ring and on the top of the breech piece must coincide.

The *breech bush* is a ring of copper screwed into the end of the powder chamber by means of the facing implements.

* *I.e.*, from face of muzzle to extreme end of breech, exclusive of breech screw.

The breech block *copper ring* is a corresponding ring on the face of the breech block. The object of these rings is to secure a close fit, to prevent any escape of gas, and also to facilitate the repair of the tube, where there is the greatest wear and expansion. They are coned in opposite directions so as to fit closely into one another.

Sighting.

The gun is sighted on both sides, to facilitate laying under certain circumstances, and to render the provision of spare sights unnecessary, and is provided with four sights, namely, two tangent sights and two trunnion sights.

The tangent sights are graduated on one of the narrow sides up to 15° , and on the other up to 3,800 yards. Each degree is divided into six divisions of 10 minutes each. The elevating nut under the cross head is marked from 1 to 10 minutes elevation. The permanent angle of deflection is $2^{\circ} 16'$ left, which compensates for the lateral deviation caused by the right-handed rifling. The tangent sights have a sliding leaf head, they are marked for $\frac{1}{2}^{\circ}$ deflection right or left.

The trunnion sights are of the "drop" pattern, and consist of a pillar, collar, and socket of gun-metal, a leaf of steel, and screw for fixing the leaf. The socket is permanently fixed in the gun, and the pillar and collar each lock into it with a bayonet joint, so that when once the sight is in its true position, it cannot be moved without first raising the collar and turning the pillar round a quarter of a circle.

DESCRIPTION OF CARRIAGE AND LIMBER.

Carriage, Siege, 6 feet Parapet, Mark I.

(See *List of Changes*, § 4407.)

The carriage consists of two brackets, trail eye, 1st class axletree, and light siege wheels.

It is fitted with elevating gear, travelling trunnion holes, a drag shoe and chain, and a step for laying; also a folding step on the right side of the carriage for loading purposes.

The brackets are built of frames of angle iron, strengthened by bar and plate-iron stays, forming lattico girders.

The axletree, which is of square iron with the ends drawn down to form the arms, is held by caps in recesses at the bottom of the brackets. Tensile stays, the front ends of which encircle the arms, forming shoulders, join the axletree to the trail.

The travelling trunnion holes are formed of wrought-iron brackets riveted on the inside to the top flange of the bracket frames.

The elevating gear consists of a stool bed, supported at one end by bolts passing through the carriage brackets, and at the other by a bolt to a double elevating screw; the nut of the screw being fixed to the base of a wrought-iron box. The outside screw is turned by means of a pair of bevel pinions in the box. One of these is attached to the screw by feathers, the other being on the same spindle as the

wrought-iron hand wheel placed on the outside of the right bracket of the carriage.

The wheels are light 1st class, Madras pattern, 5 feet diameter, 4-inch tire, with a 2-inch dish, and no strut.

The nave flanges are of malleable cast iron, and are flush with the pipe box; the front flange having an additional grease recess at the front, with three filling holes in it, closed by screw plugs.

The pipe, 12 inches long, of phosphor-bronze, with grooves, is bored to suit a 1st class axletree arm. The spokes are of English oak, 2 inches wide and 3.75 inches deep; the felloes of ash, 4 inches wide and 4.25 inches deep. The ring tire is 4 inches wide and 0.75 inch thick, and has the edges rounded off to 0.625 inch. It is secured by twelve bolts, with collars and nuts. The wheels, if demanded separately, will be called "wheels, travelling, 1st class siege, light."

To move the gun to or from the travelling trunnion holes, a wood roller is placed in bearings on the brackets, and tackles are attached to loops on the front of the brackets. The roller used has gudgeons, and is called "Roller, wood, shifting, No. 2." (§ 4500, List of Changes.)

				ft.	in.
Height to axis of gun in firing position	..	..	..	6	5.5
Track of wheels	..	..	..	5	2
				Degrees.	
Elevation, maximum	..	..	..	15	
Depression	..	..	..	5	
				cwts.	qrs. lbs.
Weight { carriage	..	..	..	19	3 0
{ wheels	..	..	..	7	0 0
Total ..	..	..	..	26	3 0
				tons.	
Tonnage	..	..	..	7.867	

Limber, Siege, 6 feet Parapet, Mark I.

(See List of Changes, § 2969.)

The limber is the wrought-iron siege limber; the futchels and splinter-bar are of wrought iron; the axletree bed is also of wrought-iron; and, with the axletree, constitutes a beam of box-girder section.

The wheels are 2nd class field, Mark III. The washer is a "loop washer," having a shorter loop than the usual drag washer.

The limber is fitted with a limber-hook steeled, with a piece of steel welded in, to prevent wear, and fitted with a steel key, 1½ inch diameter.

The shafts are, one pair "near" and "off," the former being of the field pattern, and the latter similar to the field pattern, but having a loop on the iron for the stay of the outrigger; also another pair "framed" and attached to the splinter-bar. There are outriggers for four-horse draught.

The limber is arranged with one centre, and two ammunition boxes.

					cwts.	qrs.	lbs.
Weight	{	limber and shafts .. ..	..	..	6	3	22
		wheels .. ..	..	..	4	2	4
		ammunition boxes (2) ..	..	..	1	2	7
		centre box .. ..	..	..	0	0	22
Total					13	0	27

INSTRUCTIONS FOR CARE AND PRESERVATION OF CARRIAGE AND LIMBER.

Care should be taken that all nuts, screws, and bolts are properly tightened up; on no account should a hammer be used in doing this.

A nut, screw, or bolt, if removed, should be slightly oiled before being replaced; and to prevent damage by the threads crossing, a few turns should be given by hand before employing the spanner.

All bright parts should be kept clean, and, when not in use, slightly greased.

The bearings and component parts of the elevating gear must be kept clear of clotted oil, dirt, and corrosion, and well lubricated through holes provided for the purpose.

The footboard joints should be cleaned and oiled. The axletrees and grease chambers of the wheels should be frequently cleared from clotted grease, and all dirt and grit removed before lubricating. To ensure thorough lubrication, the chambers must be kept filled with grease.

Ammunition boxes should be removed occasionally, and examined underneath. Care must be taken to prevent the lodgment of water on any part of the mountings.

When carriages are parked, or placed in a shed with the shafts exposed, the latter should be raised on the props to keep the points dry.

Defects or damage should be made good without delay; if the paint becomes rubbed off at any part, it should be patched over as soon as possible.

MODE OF PACKING AMMUNITION AND STORES BELONGING TO THE GUN CARRIAGE AND LIMBER.

LIMBER.

<i>Under.</i>		<i>On footboard.</i>	<i>Under.</i>	
1 felling axe, 1 grease box, 3 lbs., 1 swingletree, 1 shovel, 1 maul, 1 drag washer, 1st class, 1 cavalry bucket.		1 pr. drag ropes, heavy, 1 lifting jack, "Clerk's," 1 swingletree.	1 swingletree, 1 bill hook, 1 spade, 1 drag washer, 2nd class, 1 pickaxe, 1 cavalry bucket.	
<i>Near box.</i>		<i>Centre box.</i>		<i>Off box.</i>
2 filled segment shells with plugs and lifting straps, 1st class.	5 5-lbs. cartridges with lubricator, in cartouch, 2 sponge cloths.	1 lubricating can of oil.	5 5-lbs. cartridges with lubricator, in cartouch, 2 sponge cloths.	2 filled shrapnel shells with primers, plugs, and lifting straps.
		1 tin box, fuze, percussion, T.C.B.L., to hold 16.		
2 filled common shells, with plugs and lifting straps, 1 case shot with lifting strap, 1 fuze pocket with spare hook borer, and bit.		1 cylinder with 5 15-sec. time fuzes with detonators. 1 cylinder with 5 9-sec. B.L. time fuzes. 3 lanyards, friction tube.		
		1 cylinder with 25 friction tubes, 2 inch pins, one 1st and one 2nd class. 1 siege hammer washer.		
		1 wood drift, 1 clinometer (1 per battery), 2 trace couples.		2 filled common shells with plugs and lifting straps, 1 case shot with lifting strap, 1 tube pocket, empty, with strap. 1 Extractor.*
			* Carried loose behind the shell, resting on the lifting straps.	

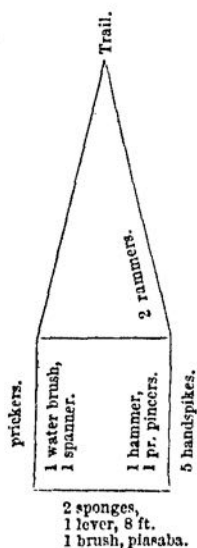
* Carried loose behind the shell, resting on the lifting straps.

On lid of "near" box.

1 Fuze extractor,
1 Tangent sight (when not in gun),
1 Pair scissors, bronze,
1 Vent bit,
1 Key plug, G.S.,
1 Cylinder, with 6 bits,
1 Hook borer,
1 Knife, clasp,
1 Trunnion sight, spare.

On lid of "off" box.

1 Tangent sight (when not in gun),
2 Common spikes,
2 Keep pins,
1 Tangent sight (spare),
2 Trunnion sights,
1 Holdall with needles, worsted, and 5 wads, fuze hole, in pocket.



PROJECTILES.

(See Plate II.)

		Weight.	
		lbs.	ozs.
Shells	segment	{ empty, about	39 0
		{ bursting charge, about	0 13
	shrapnel	{ filled with 162 mixed metal	
		{ bullets, 16 to the lb., burst-	39 3
Shot		{ ing charge 3 oz.	
	common	{ empty, about	37 14
		{ capacity for bursting charge	2 4
	case	{ filled with 358 oz. sand shot	31 8
Drill	solid (for prac-	{ packed in clay and sand, about	
	tice only)		40 13½
Drill	A recovered common shell with a sufficient		
	amount of the lead coating turned down to en-		
Drill	able it to pass freely through the bore		

All projectiles except the case are lead-coated, and slightly larger than the bore of the gun. Occasionally blisters appear on the lead coat; these should be pricked and hammered down. A high ring gauge should be used occasionally, to see that the lead coat has not set up or enlarged at the base of the projectile, so as to render loading difficult; the projectile can be reduced to the proper gauge by filing.

All 40-pr. R.B.L. shells are now issued with their fuze holes adapted to the general service gauge.

Segment and shrapnel shells are used against bodies of troops when the range is beyond the effective powers of case shot.

Common shell is used against earthworks, buildings, &c.

Case shot is used for close quarters against troops.

FUZES.

(See Plates III and IV.)

Metal, Percussion, R.L., Mark II.

Wood, Time, 15 secs., with Detonator, Mark III.

CUP, TIN, SIDE-CLOSING, MARK I. WITH SLOT.

(Vide Plate IV.)

This cup has a rectangular slot 0.6 inch in width, and 3.33 inch in length cut in it, as shown in the woodcut. It is the same in other dimensions, &c., as the ordinary service "tin cup, for 40-pr. R.B.L. guns," which can, if required, be converted by cutting the slot in it. There is a special extractor also for the cups.

INSTRUCTIONS FOR THE PREPARATION OF SHELLS AND FUZES AND THE EXAMINATION OF FILLED SHELLS.

(See Clause 175, *Army Circulars*, 1884.)

Filling Shells.

Common and Segment.

Remove the plug from the fuze-hole, insert the leather funnel and pour in the bursting-charge; the shell should be tapped with a mallet or a piece of wood to ensure its being completely filled, just leaving room for the fuze if it is to be fuzed with a time-fuze, this can be done by inserting a piece of wood the same size as the fuze; after filling the shell carefully wipe every portion of powder from the fuze-hole, then fix the fuze or plug as may be required.

In shells that are liable to be moved, or that are not required for immediate use, insert the wad, papier mâché, G.S., with the side on which the shalloon is cemented downwards, *i.e.*, next the powder; drive it in with the "drift, wood, G.S.," as far as the shoulder on the drift will allow, and then screw in the fuze or plug, as may be required.

Shrapnel.

Remove the plug from the fuze-hole, and after seeing that the fuze-hole is clear of any dirt, &c., insert the leather funnel and pour in the bursting-charge, which has been previously weighed out or measured. This must be done gradually, for if the whole of the powder is put in at once the tube will probably become choked. The shell should be tapped on the side with a wooden mallet, until the whole of the bursting-charge has passed down the tube, taking care that none of the powder is left at the bottom of the socket. Drop in the metal primer and, by means of the large diaphragm Shrapnel screwdriver, screw it tightly into the tube, and then screw in the fuze or plug as may be required.

Fixing Plugs and Fuzes and securing Shells.

When plugs or metal fuzes are screwed into shells, they will be lubricated with Field's grease, No. 3, if for use at home stations, or in British North America. Price's composite grease is to be employed at all other stations. Projectiles fitted with plugs and kept in exposed situations where the plugs are liable to become set fast by corrosion from the action of salt water or otherwise, should have their plugs unscrewed once at least every six months, and the screws cleaned and re-lubricated as above.

Instances have occurred in which fuze-hole plugs of common shells have been so jammed in as to be immovable, in consequence of using the "Wrench, removing base plugs of Palliser shells." The "Key,

iron, fuze and plug, G.S.," and the "Key, iron, plug, G.S.," are the only implements which should be used for screwing in the G.S. plug.

Distinguishing Marks of Shells.

All filled shells must be marked with the word "Filled," and date, "Bag," if a bag is used, and a red disc, 1-inch, if shalloon primers have been inserted. The colour of the paint will be red on a black ground or black on a red ground. At stations where means are available the monogram is to be painted on the shell.

Shells which have been emptied will be marked on the head with the letter E in red paint.

Preparing Fuzes.

Fuze, Time, Wood, with Detonator.

These fuzes are prepared for any desired time of flight by boring through the side-hole corresponding to the required time, into the composition.

When using the hook-borer place the fuze in the hook of the hook-borer in the proper position for boring the required hole; enter the bit into the side-hole, screwing up until the bit has entered as far as the borer will allow, taking care to press the fuze with the fingers so as to ensure its bedding fairly in the hook.

Unscrew, and, when the bit is quite clear, remove the fuze from the hook. The length of the bit is so regulated that, when placed in the handle, it will enter sufficiently far into the composition when screwed down to the shoulder. If the bit should become unserviceable, the handle must be detached from the shank and the tightening-screw unscrewed, the square hole in the hook being made for that purpose. Care must be taken when substituting another bit that it is properly placed in the handle, and that the tightening-screw firmly presses upon it, for if any space be left between the handle and the head of the bit, the end will not enter a sufficient depth into the composition. The borer should be occasionally examined and cleaned. The operation of preparing the fuze and fixing it in the shell takes, on an average, about 15 seconds; with a little practice these operations may be performed in a shorter time.

Fixing Fuzes.

Fuze, Time, Wood, with Detonator.

These fuzes should be screwed into the fuze-hole by hand; when they cannot be screwed any further they are properly secured. These fuzes must not be fixed by striking them with a mallet or any other instrument, neither must they be struck against anything.

The safety-pin will not be withdrawn until just before entering the shell into the breech.

Fuzes, Percussion, R.L.

These fuzes require no preparation except the removal of the safety-pin; they are screwed firmly into the fuze-hole by means of the "Key, iron, plug, G.S."

The safety-pin will not be withdrawn until just before entering the shell into the breech.

Examination of Shells.

Common, Double, and Segment Shells, filled with loose Powder without Bags.

Remove the fuze-hole plug, pass the "metal hook for removing wads" through the hole in the centre of the wad, and draw the wad out of the fuze-hole; if the powder charge is in a serviceable condition, insert a new papier-mâché wad, and re-plug the shell as directed in instructions for filling. If the powder charge is found to be caked from the effects of damp, empty the shell and clean it out. If the powder is so caked that it will not run out of the shell, or if any powder remains adhering to the interior of the shell, fill the shell with boiling water and allow it to stand for about five minutes, then pour out the water and fill up again with boiling water. After standing for 15 minutes more, the shell may be emptied, using the copper scraper for shells to facilitate the removal of the wetted powder. The scraper must not be applied until after 15 minutes have elapsed after the second quantity of boiling water has been poured in. When the shell is perfectly dry, refill with serviceable powder.

Note.—If means are available, a wooden horse placed over the open mouth of an empty powder-barrel should be used when emptying shells by up-ending them.

CHARGES.

Service, 5 lbs. R.L.G.² powder (*i.e.*, $\frac{1}{8}$ weight of projectile).

Saluting and exercise, 3 lbs. exercise powder. (*Vide* List of Changes, para. 4460.)

Drill.—A wood cylinder covered with felt and placed in a leather case, base shod with copper, dummy lubricator, marked same as service cartridge.

MAKING UP CARTRIDGES.

(*See* Clause 155, *Army Circulars*, 1883.)

Care will be taken that the cartridge bags are properly dry before being filled.

One half of the charge will be carefully weighed out and inserted in the bag by means of the funnel, copper, cartridge, then the paper cylinder will be placed on the powder in the centre of the cart-

ridge flat side uppermost, and the second half of the charge weighed and poured in. When filled, the cartridge will be choked *tightly* round the groove of the wood socket into which the lubricator is screwed, the greatest care being taken to fix the socket in the centre of the cartridge.

Hooping.—Draw the braid through the sergo or silk cloth until the knot of the loop comes home to the sergo or silk cloth, the single end being already passed through the loop from underneath, pass the single end to one side of and under the loop, then draw the hoop tight and keep it so by placing the forefinger of the left hand firmly on the loop; bring the running end between itself and the loop, and draw tight the single bend thus formed, *taking care that the bend bites on the loop and not on the single end*, otherwise the knot will slip. The maintenance of the proper form of the cartridge depends on the hooping being thus secured.

Marking Filled Cartridges.

All cartridges issued from store filled will have the initial or monogram of the station at which they are filled stamped on the bottom end. Cartridges filled with L.G. powder will be marked with the letters "L.G." in *red* printer's ink, 1 inch long. About $\frac{1}{4}$ oz. of ink will be sufficient for 100 cartridges.

The cartridges filled by the Royal Artillery will be distinguished by having no initial letter stamped on them. This order does not apply to cartridges filled by working parties of Royal Artillery for the Ordnance Store Department (see § 3564, "List of Changes in War Material," &c.)

Finished Cartridges.

All cartridges will be very carefully examined and gauged as to length and diameter previous to packing.

RANGE TABLE.

Calibre of gun, 4.75 inches.
Charge, 5 lbs. R.L.G.²
Projectile, common shell.

Gravimetric density, $\frac{63.4}{0.438}$.
M.V., 1,180 f.s.

[illegible]

DRILL WITH GUN ON 6 FEET PARAPET CARRIAGE.

The detachment consists of nine members, and falls in two deep.

TO TELL OFF.

<u>Officer.</u>	|	<u>No. 1.</u>
<u>Tell off.</u>		

At "Tell off" No. 1, who is on the left of the detachment, takes a pace to his front, turns to his right and numbers himself 1; the right hand man of the rear rank numbers himself 2; the right hand man of the front rank 3, and so on to the left.

After the detachment is told off, No. 1 falls in again on the left of the front rank.

The detachment is marched into the battery, and halted in line, facing the parapet, and to the left rear of the platform.

The detachment is now in the position of "detachment rear."

TO TAKE POST UNDER COVER.

<u>Officer.</u>	|	<u>No. 1.</u>
<u>Take post under cover.</u>		<u>Right turn.</u> <u>Double march.</u>

The detachment, stepping off, wheels to its left at the left corner of the platform; the front rank filing to the left of the gun, the rear rank to the right; 2 and 3 halting close to the parapet, and near the embrasure; 4 and 5 forming upon their right and left, and the whole turning to the right-about together. No. 1 follows in rear of the detachment, keeping under cover as much as possible; 6 and 8 go to the cartridge store (6 outside) and 7 and 9 to the shell store (7 outside).

TO TAKE POST AT THE GUN.

<u>Officer.</u>	|	<u>No. 1.</u>
<u>Take post at the gun.</u>		<u>Right turn.</u> <u>Double march.</u>

Where there is no parapet, the detachment files on the gun at "Take post on the gun," Nos. 2 and 3 halting in line with the breech, 4 and 5 the centre of the trail, the whole in echelon outwards. No. 1 in rear of the gun, and 6, 7, 8, and 9 with the limber.

GENERAL DUTIES.

No. 1 commands, directs, or superintends boring and fixing fuzes, directs the gun into the line of fire when running up, and lays.

No. 2 runs up, sponges (if necessary), rams home, and traverses.

No. 3 runs up, removes safety pin, loads, rams home, and traverses.

No. 4 runs up, attends to breech screw, vent piece, and tin cups when used, attends to sidearms and supplies them to 2, and to elevating screw in laying.

No. 5 runs up, attends to breech screw and vent piece, primes, makes ready, and fires.

No. 6 supplies 3 with cartridges.

No. 7 attends to fuzes and brings up projectile.

No. 8 attends to cartridge store or limber, and serves out cartridges to 6.

No. 9 attends to shell store or limber, and issues shells, tubes, and fuzes.

TO PREPARE FOR ACTION.

Officer.

No. 1.

Prepare for action.

Prepare for action.

Examine gun.

"Prepare for action."

The stores are brought up as follows :—

No. 1, 6 feet handspike, sights, and file for vent piece.

No. 2, 6 feet handspike, and assists 4 with sidearms.

No. 3, 6 feet handspike and elevating screw; he also removes apron and tampons.

No. 4, 6 feet handspike, sidearms, and support, tin cups in pocket and tin cup extractor.

No. 5, 6 feet handspike, primers in pocket, tubes in box, lanyard, oil can, and hemp.

No. 6, two cartridge cases, which he leaves at the cartridge store or limber, bucket, filled, and brush, two drill cartridges for drill purposes.

No. 7, fuzes, fuze and shell implements. He obtains the fuze boxes from 9, having ascertained from No. 1 the nature of fuzes required, satisfying himself as to the correctness of fuzes and fuze implements.

No. 8 prepares to issue cartridges.

No. 9 provides a brush for cleaning shell, prepares to issue shells, tubes, and fuzes. He examines the shells carefully, cleaning them if necessary, and removing burrs. He loosens the fuze hole plug of shells that will be first issued.

The stores having been brought up, No. 1 will satisfy himself that the foresights fit properly on the gun, that the deflection leaves of the tangent sights work easily, and that the platform is properly swept. He receives reports from the numbers responsible of any irregularity or deficiency in connection with the gun, ammunition, or stores. He ascertains that the breech fittings are properly put on and well oiled.

Should the indicator ring require adjusting, he adjusts it in the following manner:—The vent piece is screwed home as for firing; the lever and tappet ring are then removed; the indicator ring is then passed over the octagonal part of the breech screw, so that the arrow marked on it, or raised line, will correspond with a similar mark on the gun. If the arrows cannot be made to coincide, the indicator ring is to be so placed that the arrow on it will be to the left of the mark on the gun, as close as the cogs on it will permit. The tappet ring and lever are then replaced.

These should be put on so that the lever ball will be resting on a cam of the tappet ring on the right side of the gun, in a convenient position for 4 to give two taps after the breech is screwed up.

The sidearms are laid down to the right of the gun and parallel

to it, heads to the front, resting on the support provided, sponge next the gun, and in line with the breech when the gun is run up. The sponge bucket is placed near the sponge head.

The handspikes are laid down bevels up, two on each side of the platform, close to the carriage, points to the front; those of 2 and 3 outside and about 2 feet in advance of those of 4 and 5. No. 1 places his handspike parallel to the others, but in rear of the platform. The tin cup extractor is placed in a loop on the carriage. If the indicator, tappet ring, with keep-pins and lever, have been detached, 4 and 5 bring them up and put them on, under the superintendence of No. 1. No. 4 sees that the elevating screw is properly oiled; 5 straps the tube box round his waist on the right side, and the primer pocket on his left side, doubling the lanyard in four and placing it under his belt. He fills the tube box with friction tubes, which he procures from No. 9.

If the gun is to be prepared for drill only, 8 and 9 provide two salvages and a tackle. They hook the moveable block to a salvagee passed through the trail eye, and the standing end to one passed round a holdfast in rear of the platform. No. 6 provides two dummy cartridges, 7 a drill shell, and 4 a drill vent piece.

At "*Examine Gun*," No. 4 elevates sufficiently to enable No. 1 to look through the bore; and, after unscrewing the breech screw, presses the catch of breech block with his left hand, withdraws the breech block with his right hand as far as the stop.

At "*Clear*," from No. 1, 4 pushes home the breech block, 5 then takes the lever handle in his left hand, back up, and turning the handle towards him, screws up the breech screw until it is home. 4 and 5 then go under cover.

If No. 1 gives "*Sponge out*," No. 2 provides himself with the sponge and sponges out the gun. At "*Clear*," 4 and 5 act as before detailed, 2 passes the sponge over his head as he turns left about, replaces it, and goes under cover.

No. 1 then directs 5 to fire a tube.

TO LOAD.

<i>Officer.</i>		<i>No. 1.</i>
Range—yards.		Run up. Halt.
With—load.		With—load.

The gun is generally run up before loading. At "*Run up*," 2, 3, 4, and 5 take up their handspikes at the centre, with the hands next the parapet, backs up, the other hands at the small ends, backs down; 2 and 3 apply their handspikes horizontally over the spokes of the wheels in front, under the brackets close to the breast, and bear down; 4 and 5 use their handspikes as levers of the second order, under the rear part of the wheels; all the numbers facing to the rear; No. 1 applies his handspike under the trail eye, and guides the gun into the line of fire. As soon as the wheels nearly touch the hurter. No. 1 gives "*Halt*," slides his right hand, back up, to the centre of the handspike, and throws it to the rear. 2, 3, 4, and 5 withdraw their handspikes, turn inwards, lay them down, and go under cover.

At "*Load*" No. 4 withdraws the breech block, releases the tin cup with the special extractor passed through the breech screw, removes it from the side, and cleans the breech block if required; 4 then goes under cover.

2 and 3 then step in and place themselves in position for loading;

3 receives a shell from 7, removes the safety pin of the fuze, and introduces the shell its own length into the bore, point to the front; 2 then receives the rammer from 4, and, assisted by 3, rams home the projectile, their outward hands back under, inner hands back up; 3 then turns to his right, withdraws the cartridge from the cartridge case, places it in the bore, choke to the front, and goes under cover; 2 presses the cartridge gently home, withdraws the rammer, replaces it, and goes under cover.

Should "*Sponge out*," be given, 2 receives the sponge from 4, introduces it into the bore, and sponges out in two motions; he then withdraws the sponge, cleaning the chamber well and hands it back to 4.

No. 4 lifts the sponge (if required) with his left hand back under, turning to the right about as he does so, and hands it to 2, waits for it, replaces it, and then takes up the rammer, hands it to 2, and goes under cover.

As soon as the gun is loaded, No. 4 puts in the tin cup from the side, pushes home the breech block, and with No. 5, screws up the breech screw as before detailed, 4 (for additional security) placing his hands on the top of the lever handle and giving two smart taps; 4 and 5 then go under cover.

No. 6 brings up a cartridge in its case, and places it on the right of 3. While the projectile is being rammed home, he uncovers the case, and as soon as 3 has withdrawn the cartridge, he removes the empty case.

7 brings up a shell, having fixed the fuze according to No. 1's directions, and hands it to 3.

8 issues a cartridge to 6.

9 issues a shell to 7.

TO LAY THE GUN.

Officer.

No. 1.

Elevate. Halt.

Depress. Halt.

Trail, right. Halt.

Trail, left. Halt.

No. 1 looks over the sights, steadying himself by leaning on the lever.

2 and 3 pick up their handspikes and go to the end of the trail facing to the rear ready to traverse, 4 works the screw until "*Halt*" is given; 5 makes ready a tube.

At "*Trail right*," 3 heaves over the trail, and at "*Trail left*," 2 heaves it over.

N.B.—When the gun is mounted on Clerk's platform, at "*Extreme right (or left)*," 2 and 3 apply their handspikes, and, with 4 and 5, heave over the side pieces, drawing out the iron bolts in rear for that purpose; when it is necessary to shift the trail plank, 2 and 3, using the side pieces as fulcrums, place the points of their handspikes under the trail handles, and raise the trail; 4 double-man's 2's handspike; 1 and 5 shift the plank.

If it is necessary to run back, 2 and 3 apply their handspikes in front of the wheels, using them as levers of the second order; 4 and 5 take a purchase with theirs over the most horizontal spokes in rear and under the brackets, the whole facing to the rear.

At drill, the gun is run back with tackle as with standing carriages.

Should no order to fire be given when the gun is laid, No 1 gives the order "*Under cover.*"

TO MAKE READY AND FIRE.

<u>Officer.</u>	<u>No. 1.</u>
<i>Fire—Rounds.</i>	<i>No.—Ready.</i>
	<i>No.—Fire.</i>

No. 1 lowers his tangent-scale and gives "*Ready,*" takes a tube attached to the lanyard from 5, who has shifted the lanyard to his right hand, puts it into the vent, and places himself in a position to watch the effect of the shot. 5 extends his right arm, faces the gun, 2 and 3 lay down their handspikes, and with 4 go under cover.

At "*Fire*" 5 draws the lanyard strongly towards his body without a jerk, replaces it under his belt, and mounts on the step, and drifts the vent.

N.B.—The thumb-piece of the catch should fly-up, and the stop on the handle of the breech block should close in the angle of the upper bracket on the gun, when the breech block is home.

After screwing up the breech screw, No. 1 will inspect the indicator ring previously adjusted, to see whether the breech block is in its proper position or not.

TO RUN BACK AND UNLOAD.

<u>Officer.</u>	<u>No. 1.</u>
	<i>Run back. Halt.</i>
	<i>Examine gun.</i>

At "*Run back,*" which No. 1 gives (*at drill*) immediately after the gun has been fired, the detachment double out, man the fall of the tackle arranged by 8 and 9 for the purpose, and haul the gun back, No. 1 scotching the right wheel and giving "*Halt*" when the gun is sufficiently run back.

At "*Examine gun,*" 4 and 5 unscrew the breech screw and take out the vent piece as before detailed; 2 forces the drill projectile and cartridge through the bore with the sponge; 6 and 7 receive them at the muzzle and carry them to the rear; 4 and 5 replace the vent piece and screw up the breech screw.

TO CEASE FIRING AND REPLACE STORES.

<u>Officer.</u>	<u>No. 1.</u>
<i>Cease firing.</i>	<i>Examine gun.</i>
<i>Replace stores.</i>	<i>Sponge out. Clear.</i>
	<i>Depress. Halt.</i>
	<i>Replace stores.</i>

At "*Cease firing. Replace stores,*" No. 1 gives "*Examine gun,*" which is carried out as before detailed. At "*Depress,*" 4 lays the gun "*Under metal.*" At "*Replace stores*" the stores are replaced by the Nos. who brought them up.

N.B.—The above drill has reference to a detachment under cover,

but is applicable, with trifling modifications, to the case where there is none, and the detachment takes post at the gun.

TO FORM DETACHMENT REAR.

<u>Officer.</u>	<u>No. 1.</u>
<i>Detachment rear.</i>	<i>Outward turn.</i>
	<i>Right about turn.</i>
	<i>Double march.</i>
	<i>Halt. Front.</i>

At "*Detachment rear*" No. 1 doubles to the left rear of the platform, faces to the left, and gives "*Outwards turn*:" 2 and 4 turn to their left, 3 and 5 to their right.

"*Double march*," 4 and 5, followed by 2 and 3, wheel to their right and left, and when clear of the platform to the right, and round No. 1's left shoulder, 6, 7, 8, and 9, coming up into their places; when 2 and 3 have passed him No. 1 gives "*Halt. Front*," and changes his flank by the rear.

TO CHANGE ROUNDS IN ACTION.

<u>Officer.</u>	<u>No. 1.</u>
<i>Change rounds.</i>	<i>Change rounds.</i>

In changing rounds No. 2 becomes 4; 4, 1; 1, 9; 9, 8; 8, 7; 7, 6; 6, 5; 5, 3; and 3, 2.

TO CHANGE ROUNDS WHEN LIMBERED UP.

<u>Officer.</u>	<u>No. 1.</u>
<i>Change rounds.</i>	<i>Change rounds.</i>

In changing rounds No. 2 becomes 4; 4, 6; 6, 8; 8, 1; 1, 9; 9, 7; 7, 5; 5, 3; and 3, 2.

TO UNLIMBER.

This must be done when the gun is in the firing trunnion holes.

<u>Officer.</u>	<u>No. 1.</u>
<i>Unlimber.</i>	<i>Prepare to unlimber.</i>
	<i>Lift.</i>
	<i>Limber, drive on.</i>
	<i>Lower.</i>

"*Prepare to unlimber*," No. 1 unkeys the keep chain, and with 2, 3, 4, 5, 6, and 7, stands to the trail, 2 and 3 nearest the gun.

If there are no horses, 9 goes to the shafts, and 8 to the splinter bar on the near side.

At "*Lift*," the trail is lifted clear of the pintail; at "*Limber drive on*," the limber moves on, and at "*Lower*," the trail is lowered to the ground.

TO LIMBER UP.

<u>Officer.</u>	<u>No. 1.</u>
<i>Limber up.</i>	<i>Prepare to limber up.</i> <i>Lift.</i>

The several Nos. place themselves as for unlimbering, and at "Lift," lift the trail until the muzzle rests on the ground; they then close in towards the breech and haul down the trail when the limber is in position for limbering up; No. 1 keys up, and the detachment forms the order of march as hereinafter detailed.

POSITION OF DETACHMENT WHEN LIMBERED UP.

In Order of March.

No. 1 in line with the point of the near shaft and two yards on the left of it.

2 and 3 in line with the axle-tree of the gun carriage.

4 and 5 in line with the centre of the trail.

6 and 7 in line with the axle-tree of the limber.

8 and 9 in line with the splinter bar.

The Nos. stand covering one yard from the wheels.

In Front.

Two deep, two yards in front of the shafts or the leader's heads.

In Rear.

Two deep, two yards in rear of the muzzle of the gun.

Right or Left.

Two deep, in line with the gun axle-tree, one yard to the right or left of the wheel.

CHANGE OF POSITION OF DETACHMENTS.

To form the Order of March from Detachment Front.

<u>Officer.</u>	<u>No. 1.</u>
<i>Form the order of march.</i>	<i>Right turn. Double march.</i>

"Right turn. Double march." No. 1 turns with the detachment; 2 and 3 wheel to their right and open out; each number halts when at his post: they turn to the front together, looking to 2, who turns about immediately he arrives at his post.

To form the Order of March from Detachment Rear, Right or Left.

<u>Officer.</u>	<u>No. 1.</u>
<i>Form the order of march.</i>	<i>Left turn. Double march.</i>

When the detachments are in rear or on the right they proceed

direct, but when on the left they countermarch to the left; No. 1 heads the rear rank. Each No. halts when at his post.

TO CHANGE FROM FRONT TO REAR.

<u>Officer.</u>	<u>No. 1.</u>
<i>Detachment rear.</i>	<i>Right turn. Double march.</i>
	<i>Rear turn.</i>
	<i>Right turn. Halt. Front.</i>

When the detachment is clear of the gun it turns to the rear; when in line with the position of "*Detachment rear*," it turns to the right, and when in rear of the muzzle it halts and fronts.

TO CHANGE FROM REAR TO FRONT.

<u>Officer.</u>	<u>No. 1.</u>
<i>Detachment front.</i>	<i>Right turn. Double march.</i>
	<i>Front turn.</i>
	<i>Left turn. Halt. Front.</i>

When the detachment is clear of the gun it turns to its front; when in line with the position "*Detachment front*," it turns to its left, and when in front of the leading horses it halts and fronts.

TO CHANGE FROM REAR TO RIGHT OR LEFT.

<u>Officer.</u>	<u>No. 1.</u>
<i>Detachment right (or left).</i>	<i>Right (or left) turn.</i>
	<i>Double march.</i>
	<i>Front turn. Halt.</i>

The detachment turns to its front when one yard clear of the gun wheel, and halts when in line with the axle-tree.

TO FORM DETACHMENT REAR FROM THE ORDER OF MARCH.

<u>Officer.</u>	<u>No. 1.</u>
<i>Detachment rear.</i>	<i>Right about turn.</i>
	<i>Double march.</i>
	<i>Halt. Front.</i>

2 and 3 close to the centre and wheel to their left, marking time when opposite the off wheel and two yards from it; as soon as the detachment has closed up it is halted and turned to the front.

TO FORM DETACHMENT FRONT FROM THE ORDER OF MARCH.

<u>Officer.</u>	<u>No. 1.</u>
<i>Detachment front.</i>	<i>Double march.</i>
	<i>Halt. Front.</i>

No. 1 doubles out two yards in front of the near shaft, turns to his

right, and gives "Double march." 8 and 9, followed by the other numbers, double out. As soon as 8 is clear of the shafts he inclines towards 9. When 8 and 9 arrive in line with No. 1, they wheel to their left and mark time; when the detachment is closed up, No. 1 gives "Halt. Front," turning to the front himself at the same time.

TO SHIFT A 40-PR. R.B.L. (SIDE CLOSING) GUN ON 6 FEET PARAPET CARRIAGE FROM FIRING TO TRAVELLING TRUNNION HOLES.

This must be done while the gun is unlimbered.

Strength of detachment.—About 19 Nos., or say two gun detachments.

Stores required.—The stores required, in addition to those on the gun, are as follows, viz. :—

Drag-ropes, heavy	..	..	..	..	3
Luff tackles, complete	..	..	..	..	3
Selvagees	..	..	..	..	2
Key, cross-handled, removing arcs	..	..	..	..	1

The cross-handled key is used for removing the keep pins of the bolts which secure the elevating arc in the patches.

<i>Officer.</i>	<i>No. 1.</i>
<i>Shift from firing to travelling trunnion holes.</i>	<i>Prepare to shift the gun.</i>
	<i>Hook tackles.</i>
	<i>Prepare to bear down.</i>
	<i>Bear down.</i>
	<i>Come up.</i>
	<i>Prepare to lift.</i>
	<i>Lift and heave.</i>
	<i>Halt. Lower.</i>
	<i>Prepare to bear down.</i>
	<i>Bear down.</i>
	<i>Heave and ease off.</i>
	<i>Cast off tackles.</i>

Prepare to shift the gun.—2, 3, 4 and 5 cast loose side-arms, handspikes, remove elevating arc, fittings, &c.; 2 and 3 remove cap-squares; 4 scotches the wheel in front; 5 in rear; 8 and 9 lash trail-eye to axletree bed of limber with a drag-rope.

Hook tackles.—No. 1 places selvagee on breech lever; 4 and 5 hook the double blocks to it; 6 and 7 the single blocks to the brackets on loops of carriage; they take in the slack, and stand ready for easing off, assisted by 4 and 5; 9 hooks the double block of tackle to selvagee on breech lever; 8 the single to trail plate eye, using selvagees for this purpose, they take in the slack, and pass the fall to the front.

Prepare to bear down.—2 places a 6 feet handspike in the bore, and makes fast a drag-rope to end of it; double manned by 3, 8, and 9; 6 hands roller to 1.

Bear down.—2, 3, 8, and 9 bear down. No. 1 places roller and gives,

Come up.

Prepare to lift.—All the numbers above 9 man the breech tackle.

Lift and heave.—2, 3, 8 and 9 lift; 4, 5, 6 and 7 ease off a little,

the remainder haul on breech tackle until the trunnions are over the flat part of the brackets; when No. 1 gives *Halt, Lower*, 2, 3, 8 and 9 lower the trunnions on to the brackets, the breech tackle Nos. easing off at the same time.

Prepare to bear down.

Bear down.—No. 1 removes roller.

Heave and ease off.—4, 5, 6 and 7 ease off; 2, 3, 8 and 9 steady the muzzle; remainder haul on breech tackle.

Cast off tackles.—The tackles are cast off by the same numbers that hooked them, the gun is secured by straps to the carriage for travelling.

The carriage can then be limbered up by using the limber as a lever, one end of a selvagee being made fast to the trail-plate eye, and the shafts of the limber being raised, the other end is made fast to the limber hook. By lowering the shafts the trail is raised, and skidding is then inserted underneath it. This is repeated until the limber-hook is entered into the trail eye.

TO SHIFT FROM TRAVELLING TO FIRING TRUNNION HOLES.

This must be done while the gun is unlimbered.

<u>Officer.</u>	<u>No. 1.</u>
<i>Shift from travelling to firing trunnion holes.</i>	<i>Prepare to shift the gun.</i>
	<i>Hook tackles.</i>
	<i>Arrange muzzle handspike.</i>
	<i>Taut. Heave.</i>
	<i>Cast off tackles.</i>

Prepare to shift the gun.—As before, 8 and 9 lash trail eye to axle-tree bed of limber with a drag-rope.

Hook tackles.—As before.

Arrange muzzle handspike.—As before.

Taut. Heave.—2, 3, 8 and 9 steady the muzzle; 19 eases off the check tackle; the remainder man the falls of the hauling tackle on their own sides; as soon as the trunnions rest on the flat part of the carriage brackets, 5 and 7 place points of handspikes in the trunnion holes to receive the gun.

Cast off tackles.—As before.

TO MOUNT OR DISMOUNT THE GUN ON OR FROM A 6 FEET PARAPET CARRIAGE.

(N.B.—These operations should be always performed by a gyn if possible.)

By long skids up or down the rear.

Strength of Detachment.—About 19 Nos. (two gun detachments will suffice).

STORES REQUIRED.

Drag-ropes, heavy	2
Handspikes, common, 6 feet .. .	5
Lashings, white or tarred, $1\frac{1}{2}$ -inch, 3 fms. each	4
Luff tackles, complete	2
Roller, ground, elm, $3' \times 6''$	1
Scotches, of sorts	12
Selvagees	2
Skids* oak, $14' \times 5\frac{1}{2}'' \times 5\frac{1}{2}''$	2
Skids† oak, $3' \times 9'' \times 6''$	1
Water bucket, filled, and brush	1

TO MOUNT THE GUN.

The ground roller should be placed under the gun, a little in front of the centre of gravity, the carriage at such a distance in front, that when the long skids are in position, their lower ends may be under the muzzle. The capsquares are removed by 2 and 3, and the wheels scotched by 4 and 5, for which purpose large scotches are to be preferred, though handspikes can be used for the purpose.

Place skids, hook tackles.

Taut. Heave.

Remove skids, unhook tackles.

"Place skids." "Hook tackles."—8, 9, 10 and 11 place the skids, the lower ends bevel down resting on a $6'' \times 9''$ on its flat; the upper bevel up on the medium and small quoins, which are placed on the stool-bed, between the front part of the carriage brackets; the thick ends of the quoins outwards, the points overlapping inwards.

The skids are cradled at their upper ends by the quoins, at their lower ends by two large scotches on the $6'' \times 9''$, and at an intermediate point by two medium scotches on the trail transom; they are hooked together with the hooks back up and lashed back to the trail handles.

The tackles are then hooked; 12 and 13 hooking the double blocks to a strap round the cascable, 10 and 11 the single to a strap round the breast of the carriage. The skids are then watered.

"Taut." "Heave."—The Nos. man the tackles on their own sides, and haul the gun up the skids until the trunnions fall into the firing trunnion holes.

"Remove skids." "Unhook tackles."—The muzzle is borne down and the skids and tackles cleared away by the Nos. who placed them; 2 and 3 replacing the capsquares; care should be taken to avoid fouling the worm-wheel shaft of the elevating gear with the moveable block of the right luff tackle; the shaft may be removed without much difficulty by taking off the whole of the upper and the outer half of the lower gun-metal bearings of the shaft by means of a spanner.

TO DISMOUNT THE GUN.

To effect this the gun must first be raised out of the trunnion holes.

* Weight 160 lbs., or, if strengthened with iron plates at the sides, 203 lbs.

† Two 3-inch planks, one on top of the other, may be used to support the lower ends of the long skids instead of a $6'' \times 9''$.

Raise the gun out of the trunnion holes.

Prepare to bear down

Bear down.

Come up.

Prepare to lift.

Lift.

Lower.

"*Raise the gun out of the trunnion holes.*"—2 and 3 take off cap-squares and elevating arc, 4 and 5 scotch the wheels with large scotches or handspikes, 4 in front, 5 in rear.

"*Prepare to bear down.*"—2 places a handspike in the bore, double-manned by 3, 8 and 9, 4 passes a handspike to 5 over that in the bore just in front of the face of the piece, double manned by 10 and 11, all facing the rear.

"*Bear down.*"—The muzzle is borne down.

"*Come up.*"—The breech is allowed to rest on the roller.

"*Prepare to lift.*"—4 shifts his handspike to 5 under that in the bore.

"*Lift.*"—The gun is lifted high enough for 6 and 7 to insert a handspike in each trunnion hole.

"*Lower.*"—The gun is lowered till the trunnions rest on the handspikes.

Prepare to bear down.

Bear down.

Place skids.

Come up.

Make fast breech drag-rope.

Prepare to lift.

Taut. Lift and heave.

Remove skids.

"*Prepare to bear down.*"—As before.

"*Bear down.*"—As before, the gun roller is removed by 7.

"*Place skids.*"—10, 11, 18, and 19 (or any of the higher Nos.) hook the skids together, hook back up, and place supports and cradle them, as in mounting them; they then lash them to prevent their moving towards the trail, passing the lashing ropes out to the front round the carriage brackets and back to any convenient part of the wheels or axletree, or make fast to the felloes of the wheels in front and frap.

"*Come up.*"—The breech is lowered on to the long skids.

"*Make fast breech drag-rope.*"—11 makes fast a drag-rope (not with the hook end) to the cascable.

"*Prepare to lift.*"—The same Nos. as before prepare to lift the muzzle, the other Nos. man the breech drag-rope.

"*Taut.*" "*Lift and heave.*"—The Nos. at the muzzle lift, those on the drag-rope heave, and the gun is hauled down the long skids, which should have been previously watered, on to the ground roller placed to receive the breech.

Plate 1.

CARRIAGE, SIEGE, B. L. 40-PR, 6 FT PARAPET, MARK I.

WROUGHT IRON, LATTICE GIRDER.

Scale $\frac{1}{32}$ full size.

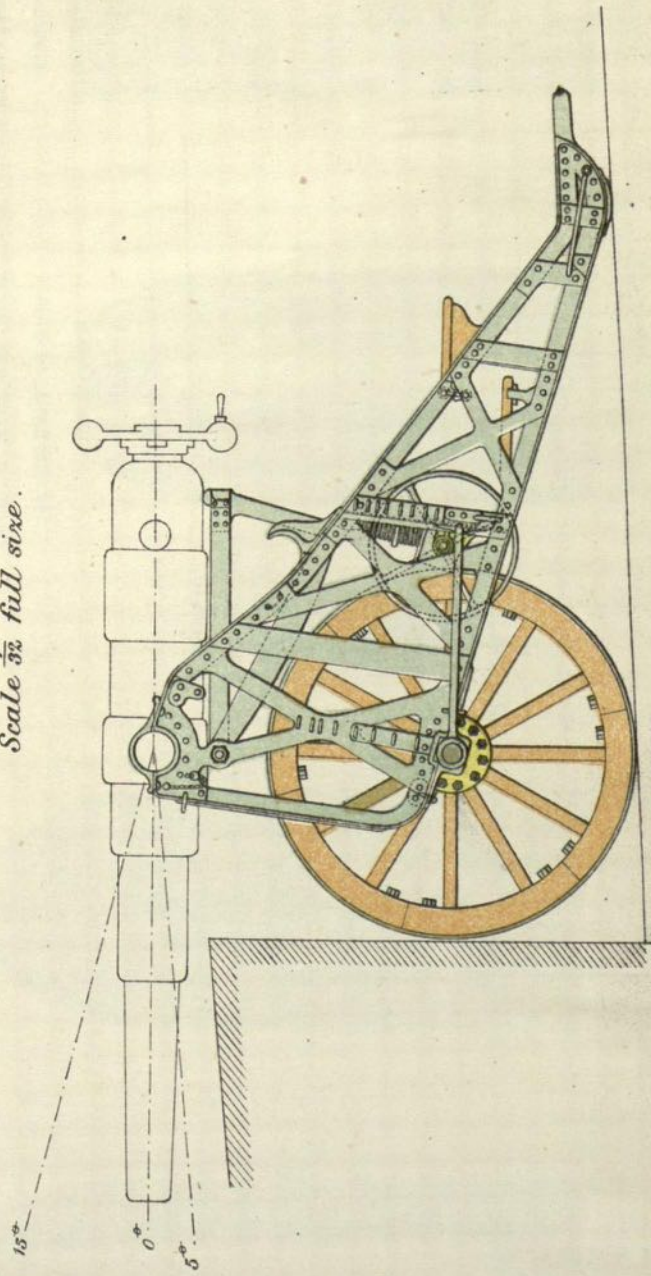
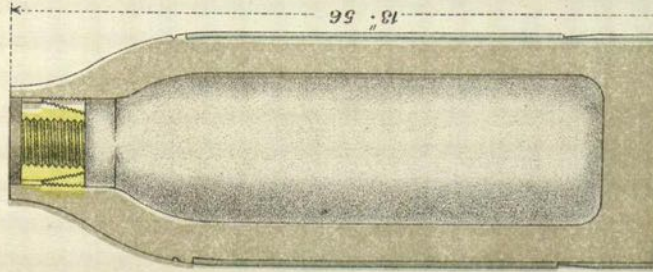


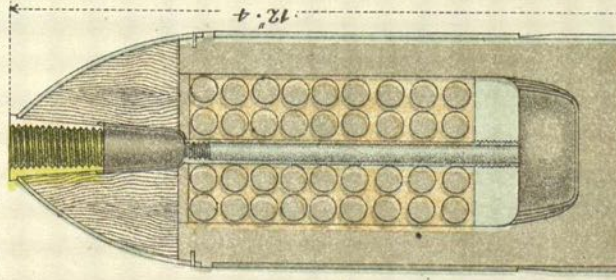
Plate II.

SHELL, RIFLED, B. L.
COMMON 40 PR



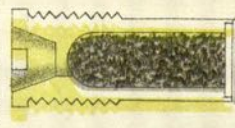
Mean Weight empty 37 lbs 4 ozs.
Capacity for bursting charge
2 lbs 4 ozs.

SHELL, RIFLED, B. L.
BOXER SHRAPNEL 40 PR



Mean Weight empty 39 lbs.
Bullets 162, 16 to the lb.
Capacity for bursting charge
3 ozs.

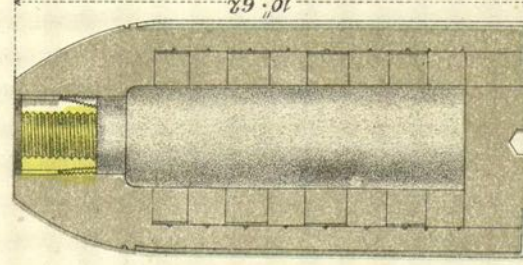
PRIMER.
FOR SHRAPNEL SHELL.



Full size

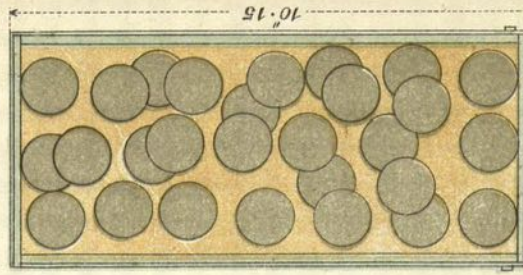
Scale $\frac{1}{4}$.

SHELL, RIFLED, B. L.
SEGMENT 40 PR



Mean Weight empty 39 lbs.
No. of Segments 72.
Capacity for bursting charge.
13 ozs.

SHOT, RIFLED, B. L.
CASE 40 PR



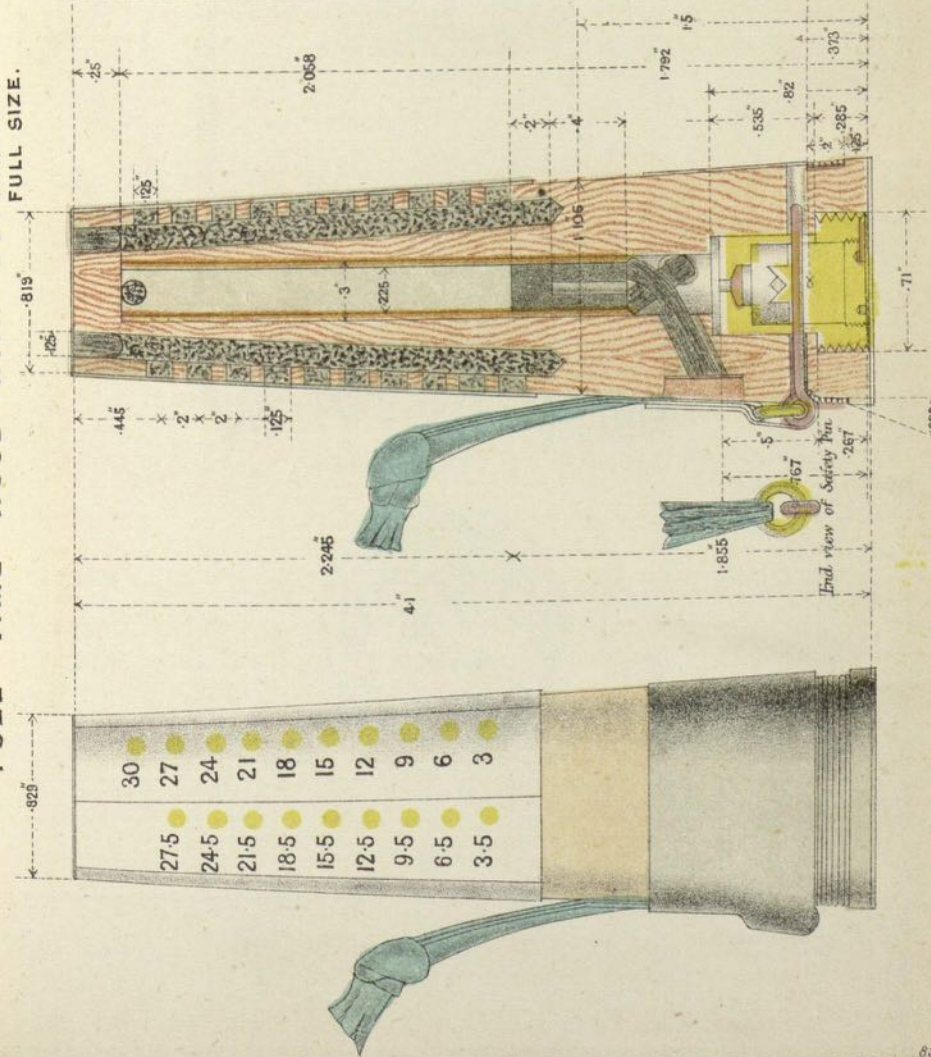
Contents 35-8 oz.
Sand Shot.
Weight 31 lbs. 8 oz.

N° 4123 $\frac{F}{458}$ (A)

FUZE TIME WOOD WITH DETONATOR 15 SECONDS. (MARK III)

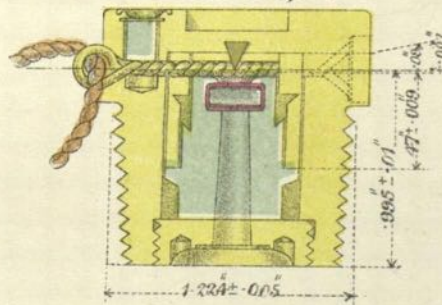
FULL SIZE.

27.5	29.5	28.5	28
24.5	26.5	25.5	25
21.5	23.5	22.5	22
18.5	20.5	19.5	19
15.5	17.5	16.5	16
12.5	14.5	13.5	13
9.5	11.5	10.5	10
6.5	8.5	7.5	7
3.5	5.5	4.5	4
	2.5	1.5	1



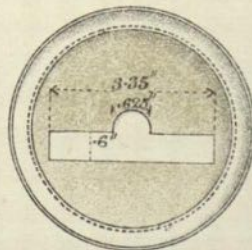
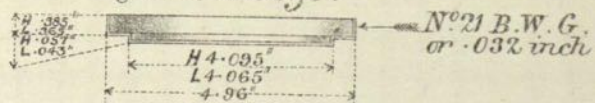
FUZE, PERCUSSION, R. L. II.

Full Size.



TIN CUP.

Quarter Size.



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ADDENDA AND ERRATA FOR THE HANDBOOK FOR
THE R.M.L. 12.5-INCH 38-TON GUN (MARKS I.
AND II.) CASEMATE DWARF AND SMALL PORT
MOUNTINGS. LAND SERVICE. 1885.

Page 22, line three. *Casemate and Dwarf Carriages and Platforms.* After " * * * and secured " read: That the preventer gear lever is lowered to relax the grip on the bar; and that the nipping lever of the running back gear is well pressed down, and caught by its pawl to ensure the sprocket plates being free of the chains.

Page 23, seventh line. "Rear Roller Jack." Instead of "In case there is not time to change it the gun may be run up" read: If the jack should break down in *action*, the gun, in cases of emergency, can be run up by. *Dele.* also from after "direction," to end of paragraph.

Page 23, second line. "Preventer Gear." After "below the top of the tripper" add: *Note.*—Immediately the carriage is run up, the grip on the bar must be relaxed by raising the lever to prevent the movement of the carriage being retarded while running back or during recoil.

Page 24, second line. "Running Back Gear." After "oil should be supplied to this" add: *Note.*—On no account must this gear be used as a "brake" in running up, as such use will cause serious damage to the gear, and render it unserviceable.

Page 25, last line but five. "Rollers and Trucks." After "When out remove the clutch lever by taking out the screws" add: Any difficulty in moving the mountings, or extra exertion required to work the gears, is due either to deficient lubrication or to the connection of some of the gears which are not then in use. In either case, the officer commanding should at once halt the detachment and ascertain the cause, as to continue working under the circumstances may be the means of putting the gun out of "action."

Page 46. "To Load." Fourth paragraph. Instead of "He then receives the rammer from 4 (with right rammer rope attached), and, assisted by 3, steadies the stave whilst the cartridge and projectile are being rammed home" read: He then receives the rammer from 4 (with right rammer rope attached), and, assisted by 3, steadies the stave until the cartridge and projectile are nearly rammed home; they then fall back on the rammer ropes.

Page 47. "To Run Up." Paragraph two, line two. Omit all between brackets. And in line six, omit "5 hauls down the lever of chain nipping gear." And in line seven, after 2, 3, 11, and 12 close the mantlets, add: The clutch gear of the running back chains should never be used in running up or back when the jack is out of order.